REMARKS

This Amendment is in response to the Office Action mailed October 15, 2001. Claims 2, 4-7, 9-16, 18, 20-21 and 23-26 are pending in the application and have been rejected. Applicants hereby respond to the rejection of claims 2, 4-7, 9-16, 18, 20-21 and 23-26 as follows.

Response to claim objections

Claims 6, 12, 16, 18, 21 and 26 were objected to in the Office Action and have been amended to adopt the suggested language. Reconsideration and withdrawal of the claim objections under Paragraph 1 of the Office Action are respectfully requested.

Response to drawing objections

The drawings were objected to under 37 CFR § 1.83(a) on the basis that the drawings do not show every feature of the invention specified in the claims. By this Amendment, FIG. 10 has been added to illustrate a protective layer as described in Applicants' specification, Page 13, lines 22-28. As amended, each of the features recited in the claims is illustrated in the figures of the application, and accordingly, reconsideration and withdrawal of the objection under 37 CFR § 1.83(a) are respectfully requested. In particular, FIG. 1 illustrates a glide tester 100 for detecting asperities on a test disc. FIGS. 2-7 and 9 illustrate a glide head including a leading or front edge 168, a trailing or rear edge 158 and an air bearing surface 154 including a raised bearing surface elevated above a recessed surface, for example rails 150, 152 in the illustrated embodiments. FIGS. 8-9 illustrate fabrication of a plurality of glide heads on a wafer 504. Accordingly reconsideration and withdrawal of the objections to the drawings are respectfully requested.

Response to objections to the specification

The disclosure was objected to on the basis that an asperity detection system, raised bearing portion, elevated bearing portion, trailing edge, leading edge, recessed bearing surface, protective layer are not described in the specification. Applicants have amended the specification and claims and as amended the subject matter claimed is supported by Applicants' specification. In particular, Applicants' specification discloses a slider or glide body including a leading or front edge 168, a trailing or rear edge 158 and an air bearing surface 154 including a raised bearing surface, for example, rails 150, 152 elevated above a recessed surface as shown in the illustrated embodiments (see FIG. 7). On Page 13, Applicants' specification describes depositing thermal transducers and covering the components with a protective, electrically insulating layer such as diamond-like carbon. (Page 13, lines 22-28). Accordingly, reconsideration and withdrawal of the objections to the disclosure are respectfully requested.

Response to claim rejections - 35 U.S.C. § 112

Claims 15-16 and 26 were rejected under 35 U.S.C. § 112 as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Claim 15 has been amended to recite a glide test system as illustrated in FIG. 1 of Applicants' specification Accordingly, reconsideration and withdrawal of the rejection of claim 15 are respectfully requested.

Claims 16 and 26 were rejected on the basis that the transducers are deposited on a raised bearing surface while according to claim 26, the thermal transducers are deposited on a surface of a wafer. FIGS. 2-7 of Applicants' specification illustrate at least one thermal transducer formed on a raised bearing surface of rails 150, 152. FIG. 8 illustrates a wafer fabrication of the heads having a thermal transducer 500

deposited on surface of the wafer 504 to form the thermal transducer on the raised bearing surface (for example, on rails 506 shown in FIG. 8) as recited in independent claim 16. The scope of the subject matter claimed is clearly definite and supported by Applicants' specification. Based upon the foregoing Applicants respectfully request reconsideration and withdrawal of the rejection of claims 16 and 26 under 35 U.S.C. § 112.

Response to claim rejections - 35 U.S.C. § 102

Claims 2, 4, 11, 14, 15-16, 23 and 25 were rejected under 35 U.S.C. § 102(b) as being anticipated by Boutaghou, U.S. Patent No. 5,808,184. The subject matter of claims 2, 4, 11, 14, 15-16, 23 and 25 is not taught nor suggested by Boutaghou as follows.

A claim is anticipated only if each and every element as set forth in the claim is either expressly or inherently described in a single prior art reference. M.P.E.P. § 2131. The present invention relates to a head having a thermal transducer formed on a raised bearing surface as claimed which is not disclosed nor taught by Boughtaghou. To establish inherency, it must be clear that the missing descriptive matter is necessarily present in the thing described in the reference, **and that it would be so recognized by persons of ordinary skill the art.** Inherency, however, may not be established by probability or possibility. The Office action fails to support that the subject matter of the present invention is inherently disclosed by Boutaghou.

The Office Action recites that since Boutaghou states that during the fabrication process, portions of rails act as substrates 28 upon which sensors layers 18 are deposited (col. 3, lines 56-58), Boutaghou inherently teaches thermal transducers formed on a raised bearing surface or raised surface of a rail as claimed. The Office Action fails to establish that the claimed subject matter is inherent to one of ordinary skill in the art.

Typically transducers are deposited or formed on what becomes the trailing edge of the slider or rail, as described in Applicants' specification. As described, thin film deposition of transducers on a trailing edge of the slider forms a relatively thin detection surface (Applicants' specification Page 5, line 1-25). In contrast as described, the present invention provides a larger detection area for the glide heads over previous designs which is not taught nor suggested by the prior art. (Applicants' specification page 6, lines 9-13).

The Office Action also states that since the rails are formed on the air bearing surface ("ABS") (FIG. 2), inherently, it is expected that the ABS be configured prior to the deposition process. Again in order to establish inherency, **it must be established that the subject matter claimed would be inherent to one skilled in the art**. As described in Applicants' specification, heads are typically fabricated on a wafer wherein the transducers are deposited on the wafer and thereafter the wafer is cut into a plurality of bars. The air bearing surface is formed at the bar level **after the transducers are deposited at the wafer level**. (See Applicants' specification page 6, line 18-24). Thus, the transducers are deposited on what becomes the trailing edge of the slider **prior to formation of the air bearing surface**. (Page 6, lines 18-24). Reliance on the statement that since rails are formed on the ABS, the ABS is formed prior to deposition of the transducer is inconsistent with previous fabrication processes and the Office Action fails to establish that the recited subject matter is inherent to a person of ordinary skill in the art. Based upon the foregoing, the Office Action fails to establish a prima facie basis to support that the subject matter claimed is unpatentable.

Claims 2, 4, 11, 14-15 have been amended to specifically recite *inter alia* a thermal transducer including a surface portion and a thickness portion and the surface portion

extending along a portion of the raised bearing surface is orientated along the air bearing surface. As described in Applicants' specification, the surface portion provide a larger contact or detection area over prior art structures having a very thin portion orientated along the air bearing surface. (Applicants' specification, Page 5, line 9-page 6, line 17).

Response to claim rejections - 35 U.S.C. § 103

Claims 5-6, 9-10, 16, 18, 21 and 26 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Boutaghou. Claims 5-6, 9-10 are dependent upon claim 2 which is not anticipated by nor obvious in view of Boutaghou and claims 18, 21 and 26 are dependent upon claim 16 which is not anticipated by nor obvious over Boutaghou as previously discussed.

Claim 9 further recite at least one transducer extending along at least half a length distance between the leading and trailing edge of the glide body and claim 10 recites at least one thermal transducer extending substantially from the leading edge to the trailing edge which is not taught by the cited reference. As described in Application specification, prior MR sensors were located on a side of the slider adjacent the air bearing surface and only an edge of the MR sensor is orientated along the ABS. (Applicants' specification, page 4, lines 33-Page 5, line 20). Because of the narrow profile along the air bearing surface, few defects will strike the head with the MR sensor at the trailing edge side (Applicants' specification, Page 5, lines 9-13). However, in the present invention, as recited in claims 9 and 10 the thermal transducer is located along a length distance of the raised bearing surface as recited to provide a desired contact surface which provides advantages and features not recognized nor appreciated by the prior art.

Claim 13 recites a glide head having a thermal transducer on the raised bearing surface and conductive strips on

a recessed bearing surface offset from the raised bearing surface. There is no motivation in the art to provide conductive strips on the recessed bearing surface for thermal transducer deposited on a trailing edge of the glide body as is known in the art. (Applicants' specification, page 5, lines 1-4) Thus, absent some motivation or suggestion, the Office Action fails to establish a prima facie basis to reject claim 13.

Claim 16 was rejected on the basis that the method steps will be met during "normal manufacturing." The Office Action provide no evidence or support that claim 16 recites "normal" fabrication steps or that the fabrication or method steps of claim 16 are known to those skilled in the art. Thermal transducers are typically deposited at the wafer level on what becomes the trailing edge of the glide body. Thereafter bars are cut from the wafer to form the ABS. Thus, as described, transducers are formed along an edge of the slider prior to cutting the slider from the wafer. As described, one of the cut surfaces from the wafer is formed into the air bearing surface according to previous wafer fabrication processes. (Applicants' specification, page 6, lines 18-24). Thus, prior wafer fabrication techniques as described do not teach nor suggest the method steps of claim 16.

Claims 18 and 21 recite a method of slicing glide heads from the wafer **and** depositing thermal transducer on the plurality of sliced glide heads which is not obvious in view of the prior art. As recited in the Office Action, claims 18 and 21 were rejected on the basis that it would be obvious to modify the method disclosed by Boutaghou so as to slice a plurality of glide bodies from a substrate. However, the Examiner has failed to establish that a wafer fabrication process including both the steps of slicing the glide heads from the wafer **and** depositing thermal transducer on the glide bodies sliced from the wafer is known in the art. As previously discussed in previous

fabrication techniques, thermal transducer are deposited at the wafer level **prior** to slicing a bar or plurality of glide heads from the wafer. Thus, the Office Action fails to establish that each of the method steps including both slicing glide heads from the wafer **and** depositing thermal transducer on the plurality of glide heads sliced from a wafer is obvious in view of the cited prior art.

Claim 26 was rejected on the basis that it would be obvious to deposit thermal transducers onto the wafer prior to slicing glide heads from the wafer. In prior fabrication techniques, thermal transducer are deposited at the wafer level as previously discussed. However, claim 26 recites that the ABS is also fabricated at the wafer level which is not taught nor suggested by the prior art. The Examiner has ignored this claim limitation and thus has failed to establish a prima facie basis to support that the subject matter of claim 26 is unpatentable.

Claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Boutaghou in view of Kennedy. Claim 7 is dependent upon claim 2 which is not taught nor suggested by the combination of Boutaghou and Kennedy nor is the further subject matter of claim 7 taught by the recited combination. Kennedy does not specifically teach conductive strips to electrically connect a thermal transducer on an air bearing surface to a conductive pad proximate to a trailing edge of a glide head as recited in claim 7.

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Boutaghou in view of Flechsig. Claim 12 is dependent upon claim 2 which is not taught nor suggested by the combination of Boutaghou and Flechsig nor is the further subject matter of claim 12 taught by the recited combination.

Claim 20 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Boutaghou in view of Nguyen. Claim 20 is dependent upon claim 2 which is not taught nor suggested by the

combination of Boutaghou and Nguyen. Nguyen discloses a conventional structure having a thin film head 28 mounted on rear of rail 24. Reference number 28 points to the trailing edge of the slider or rail and does not refer to the air bearing surface. Nguyen does not specifically teach a thin film head formed on a raised bearing surface or bearing surface of a rail . Thus, the combination of Boutaghou and Nguyen do not teach the subject matter of claim 2 nor dependent claim 20.

Claim 24 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Boutaghou in view of Ishimaga. Claim 24 is dependent upon claim 2 which is not taught nor suggested by the combination of Boutaghou and Ishimaga and accordingly reconsideration and allowance of claim 24 are respectfully requested.

Based upon the foregoing, reconsideration and allowance of the rejected claims are respectfully requested.

New claim 27 has been added for consideration and allowance. Favorable action with respect to new claim 27 is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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MARKED-UP VERSION OF REPLACEMENT PARAGRAPHS

Replacement paragraph for the paragraph beginning on Page 8, line 29 and ending on Page 9, line 10:

An embodiment of glide head/slider 132 is depicted in Fig. 2. Glide head 132 includes two rails 150, 152 on air bearing surface 154. A thermal transducer 156 is located on rail 150. Thermal transducer 156 is located near rear edge or trailing edge 158 of glide head 132. Electrically conducting pads 160, 162 provide electrical contact between thermal transducer 156 and the top of glide head 132. Pads 160, 162 are connected to a measurement circuit at the top of the glide head such that the electrical resistance of thermal transducer 156 can be monitored. To improve the aerodynamic performance, steps 164, 166 are located near front edge or leading edge 168 of glide head 132. The contoured features on the air bearing surface can be varied to achieve a desired aerodynamic performance of the glide head.

Replacement paragraph for the paragraph beginning on Page 9, line 25 and ending on Page 10, line 8:

The back edge or trailing edge of glide head 132 generally flies closer to the surface of the disc than the front edge or leading edge. The pitch of glide head 132 is due to aerodynamic forces. Therefore, placement of the thermal transducer near the rear edge or trailing edge of the glide head provides for the detection of smaller asperities for a given fly height. Nevertheless, if desired the thermal transducer can be placed away from the rear edge or trailing edge. Such an alternative embodiment is depicted in Fig. 3. Thermal transducer 180 is located on rail 182. Electrical conduction strips 184, 186 provide for electrical conduction between thermal transducer 180 and electrical conduction pads 188, 190. Electrical conduction pads 188, 190 provide a path of electrical conduction between

strips 184, 186 and the top of glide head 132. Electrical conduction strips 184, 186 can be produced from electrically conductive metal, alloys, metal compounds or combinations thereof.

Replacement paragraph for the paragraph beginning on Page 14, line 29 and ending on Page 15, line 4:

To form the sliders with the thermal transducers located on the air bearing surface, a plurality of thermal transducers 500 can be applied along the smooth surface 502 of wafer 504, as shown in Fig. 8. Thermal transducers 500 are located on rails 506 contoured onto surface 502. Representative rails 506 are noted in Fig. 8. As shown in FIG. 10, the thermal transducers 500 can be covered with a protective layer 516, such as diamond-like carbon. Additional transducers such as a piezoelectric transducer also can be placed on the opposite surface of the wafer prior to the slicing into individual sliders.

MARKED-UP VERSION OF REPLACEMENT CLAIMS

2.(Thrice Amended) A glide head comprising:

a glide body including a leading edge, a trailing edge and a raised ~~bearing portion including an elevated~~ bearing surface ~~generally transverse to the leading edge~~; and

at least one thermal transducer ~~that is~~ formed on the ~~elevated~~raised bearing surface having a surface portion extending along a portion of the raised bearing surface and a thickness portion intersecting the surface portion extending along the portion of the raised bearing surface to form a glide interface to detect asperities.

4.(Twice Amended) The glide head of claim 2 wherein the raised bearing ~~portion~~surface includes opposed side rails oriented along a length of the glide ~~head~~body and the at least one thermal transducer is formed along a portion of a length of at least one of the opposed side rails.

6.(Twice Amended) The glide head of claim 2 wherein the at least one thermal transducer is in electrical contact with electrically conductive pads proximate to the trailing edge of the glide body.

12.(Twice Amended) The glide head of claim 11 wherein the plurality of thermal transducers comprise a first thermal transducer and a second thermal transducer and the first and second thermal transducers share a common electrical ground.

13.(Twice Amended) The glide head of claim 11 wherein the plurality of thermal transducers are spaced along the ~~elevated~~raised bearing surface and the glide head further

comprises electrically conductive strips in electrical contact with the plurality of thermal transducers, the strips being formed on a recessed bearing surface offset from the ~~elevated~~raised bearing surface.

15.(Twice Amended)The glide head of claim 2 in combination with ~~an asperity detection system~~glide test system.

16.(Fourth Amended) A method of fabricating a glide head comprising:

fabricating ~~an air bearing including~~ a raised bearing surface and a recessed surface; and

depositing a thermal transducer on the raised bearing surface to form a glide interface to detect asperities.

18.(Thrice Amended) A method of fabricating a glide head from a wafer comprising;

slicing a plurality of glide ~~heads~~bodies from the wafer; and

depositing thermal transducers on the plurality of glide ~~heads~~bodies sliced from the wafer.

21.(Twice Amended)The method of claim 18 and further comprising:

fabricating an air bearing on the plurality of glide ~~heads~~bodies sliced from the wafer including a raised bearing surface and a recessed bearing surface prior to ~~the deposition of~~ depositing the thermal transducers; and

depositing the thermal transducers on the raised bearing surfaces of the plurality of glide ~~heads~~bodies sliced from the wafer.

23.(Amended)The glide head of claim 2 including a plurality of spaced thermal transducers spaced along a length of the glide

~~head~~body between the leading edge and the trailing edge of the glide body.

25. (Amended) A glide head comprising:

a glide body including a leading edge, a trailing edge and a raised bearing ~~portion~~surface and a recessed bearing surface; and

asperity detection means on the glide body for detecting asperities on a disc surface.

26. (Amended) The method of claim 16 wherein the step of fabricating the raised bearing surface and the recessed surface and the deposition of the thermal transducer~~fabrication of the air bearing~~ is performed on~~to~~ a surface of a wafer prior to slicing a plurality of glide heads from the wafer.